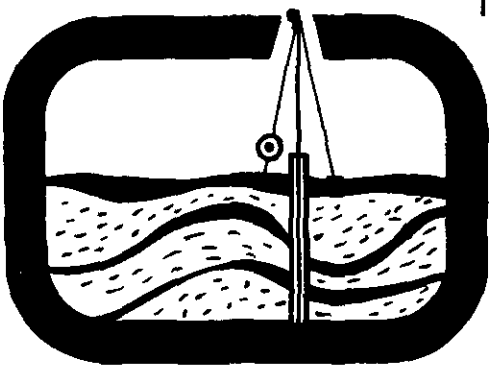
SUBSURFACE INVESTIGATION REPORT

for

CONTRACT NUMBER DACW33-83-D-0006
WORK ORDER NUMNER 0001

PROPOSED HYDRAULIC PISTON ELEVATOR
BUILDING 313
WATERTOWN ARSENAL

JUNE 14 & 15, 1983



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1.0 GENERAL

1.1 Authorization

The subsurface exploration work for the proposed hydraulic piston at Building 313, Watertown Arsenal, described herein was performed under Contract DACW33-83-D-0006, Work Order No. 1, dated 15 June 1983. The Contracting Officer is Carl B. Sciple, Col, C.E.

1.2 Project Site

The site is located at Building No. 313, Watertown Arsenal, Watertown, Massachusetts.

1.3 Purpose and Scope of the Investigation

The purpose of the investigation is to determine the founding conditions for a proposed hydraulic piston elevator being designed by an A-E for the Watertownn Arsenal. The subsurface conditions were determined by performing one wash boring with standard penetration tests (SPT) every five feet or change in strata. The boring was taken to a depth of 40 feet below the bottom of the elevator shaft. The boring was located within the existing elevator shaft. A copy of the exploration instructions are attached to the report.

2.0 QUALITY CONTROL

2.1 Equipment

The equipment and type of tools used are described below.

a. Core Drill: The drill used was a portable motorized cathead powered by a 9 HP Briggs & Stratton gasoline engine.

b. Drive Hammer: The drive hammer used to advance the casing weighed approximately 300 pounds. The drive hammer used to advance the split spoon sampler weighed 140 pounds.

c. Casing and Rods: BW (2-1/2 in) flush joint casing was used to keep the borehole in overburden. AW drill rods were used in washing out the casing.

d. Samplers: The equipment used to obtain soil samples was the 2.0 in O.D. by 1-3/8 in I.D. split barrel sampler type with a ball check head. The sampler was 24 inches long.

2.2 Records

NED Forms 58 and 58A, dated March 1971 and entitled "Field Log of Test Boring" record pertinent drilling and sampling data. The logs include the following:

a. Site location, boring location and number.

b. Make and model of drilling equipment.

c. Type of drilling and sampling operation by depth.

d. Depths at which soil samples were recovered, including top and bottom depth of each run. Classification or description of the soil obtained. Indication of penetration resistance such as drive hammer blows given in blows per penetration depth for driving sample spoons.

e. Length of sample of soil recovered per sampling run.

f. Depth at which groundwater is encountered.

2.3 Procedures

a. The boring work was performed in accordance with the procedures for Standard Penetration Tests specified in ASTM D-1586. Samples were taken at 5 foot intervals or where there was a change in the soil strata.

b. The sample spoon shoes were kept reasonably sharp at all times. Dull, bent, or otherwise damaged samplers were not used. Sampling was accomplished to a depth of not more than two feet below the bottom of the casing, after which the casing was advanced to the top of the next sampling interval and cleaned out using appropriately sized side discharging chopping bits.

c. Samples were classified in the field immediately following the taking of the sample. Representative samples were taken from each soil sampling run anad placed in 16 oz. glass jars with hermetically sealed lids. Jars were labeled with sample number, sampling interval, boring number, date, location and penetration resistance. A chain of custody logs were not maintained. Upon completion of the boring the soil samples were turned over to Captain Binseel of the Watertown Arsenal.

2.4 Safety

The work was performed without personal injury or accident. The contractor's personnel wore hard hats and ear protection. A safety briefing was conducted. The Safety Report is attached to this report.

BRIGGS ENGINEERING CORPORATION

WEEKLY SAFETY MEETING

TO: Safety Office, NED

FROM: Field Engineer Date held 6-13-83

THRU: Project Engineer Time 1600

Weekly safety meeting was held this date for the following personnel:
Contract No. DACW 33-83-D-0006, W. O. No. 1 Personnel present:
J. Mullen
Conducted By: N.A. Lanney C. Reil

1. Subjects discussed (Note, delete, or add):

x Individual Protective Equipment - Ear protection, hard hats
Prevention of Falls -
Safe Lifting Techniques -
x Emergency Communications -
Fire Prevention -
x Sanitation, First Aid -
Tripping Hazards - trash, hose, nails in lumber -
Staging, Ladders, Concrete Forms -
Hand Tools -
Portable Power Tools -
Woodworking Machinery -
Equipment Maintenance (Zero defects) -
Hoisting Equipment -
Ropes, Hooks, Chains and Slings -
Electrical Grounding, Temporary Wiring -
Lockouts for safe clearance procedures -
Electrical, pressure, moving parts -
Welding -
Excavations -
Loose Rock and Steep Slopes -
Explosives -
Water Safety -
x Other - Proper ventilation of the work area

Prepared by: Nicholas A. Lanney
Field Engineer

2. Exposure:

For the period from June 14 to June 15, 1983, covering 2 men for 32 man-hours. This completes the work performed under Work Order No. 1

Signature: Nicholas Lanney
Project Engineer

3. Forwarded: NED, Waltham, MA

CORPS OF ENGINEERS, U. S. ARMY
NEW ENGLAND DIVISION
FOUNDATION AND MATERIALS BRANCH

FIELD LOG OF TEST BORING

PROJECT NO. WO #1

Site Watertown Arsenal — Page 1 of 5 Pages

Hole No. FD-83-1 Diam. (Casing) 2 3/8" — Boring Started June 14, 1983

Co-ordinates: N _____ E _____ — Boring Completed June 15, 1983

Drilled by Eastern Geotechnical Ass. — Report Submitted _____

Purpose of Exploration Determine founding conditions for a proposed hydraulic piston elevator at Bldg 313 Watertown Arsenal

Elevation Top of Hole N/A M.S.L. — Casing Left in Place 0 Feet

Total Overburden Drilled 40 Feet

Elevation Top of ~~Rock~~ N/A M.S.L.

Elevation Bottom of Hole N/A M.S.L.

Total Rock Drilled 0 Feet

Total Depth of Hole 40 Feet

Core Recovered N/A %

Core Recovered 0 Ft.; ____ Diam. ____ In.

Soil Samples 13/8 In. Diam. 10 No.

Soil Samples _____ In. Diam. ____ No. — Water Table Depth Not encountered

Depth From	Depth To	Method of Drilling and Type of Bit Used
0	30	Casing - Chopping Bit
30	40	No Casing Chopping Bit

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Prepared by Charles Reil / N. Lanney (Field Data) — (Lab. Data)

Submitted by N. Lanney

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site Watertown Arsenal Page 2 of 5 Pages

Boring No. FD-83-1 Desig. A Diam. (Casing) 2 1/8"

Co-ordinates: N _____ E _____

Elevation Top of Boring ___ M.S.L.
Total Overburden Drilled 40 Feet
Elevation Top of Rock ___ M.S.L.
Total Rock Drilled 0 Feet
Elevation Bottom of Boring ___ M.S.L.
Total Depth of Boring 40 Feet
Core Recovered ____ % No. Boxes ____
Core Recovered ____ Ft. ____ Diam. ____ In.
Soil Samples 1 3/8" In. Diam. 10 No.
Soil Samples ____ In. Diam. ____ No.

Hammer Wt. 140 Boring Started 6-14-83
Hammer Drop 30" Boring Completed 6-15-83
Casing Left 0
Subsurface Water Data ____ Page 5
Obs. Well N/A
Drilled By Eastern Geotechnical
Mfg. Des. Drill Briggs & Stratton
Inspected By: ____
Classification By: C. Reil
Classification By: ____

DEPTH 1" = 2'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
0	S1	1 3/8"	0 to 2'	18 22 17 21	Drove 1 3/8" ID by 24" split-barrel sampler from 0.0* to 2.0 ft. Recovered 19"	Dry, dense, fine to medium brown sand, some gravel.
2	No Samples taken from 2.0 to 5.0'				Drove 2 1/2" casing from 0 to 5.0' and washed out casing.	
4						
6	S2	1 3/8"	5' to 7'	11 16 17 26	Drove 1 3/8" ID by 24" split barrel sampler from 5.0 to 7.0 ft. Recovered 13"	Dry, dense fine to medium brown sand, trace of gravel.
8	No Samples taken from 7.0 to 10.0'				Drove 2 1/2" casing from 5.0 to 10.0 ft and washed out casing	

GENERAL REMARKS:
* Depths referenced from bottom of 6" concrete slab.

Site: Watertown Arsenal	Boring No. FD-83-1	Page 3 of 5

DEPTH	1" = 2'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	10–12	S3	1 3/8"	10' to 12'	11, 11, 17, 26	Drove 1 3/8" ID x 24" split-barrel sampler from 10' to 12'. Recovered 14".	Moist, dense, fine to medium brown sand. Strong odor of fuel oil.
	12–15.5	No samples taken from 12.0 to 15.5'				Drove 2 1/2" casing from 10' to 15' and washed out casing.	
15.5' – 17.0'	15.5–17	S4	1 3/8	15.5 to 17.0	17, 27, 41, 46	Drove 1 3/8" ID by 24" split-barrel sampler from 15' to 17' and recovered 16".	Very dense, fine to medium brown sand and gravel. Trace of silt.
	17–19	No samples taken from 17.0 to 20.0'				Drove 2 1/2 casing from 15' to 19' and washed out casing.	
	19–21	S5	1 3/8"	19' to 21'	7, 10, 12, 14	Drove 1 3/8" ID by 24" split-barrel sampler from 19' to 21'. Recovered 15".	Wet, medium fine brown sand, some silt with clay layers.
	21–25	No samples taken from 21.0 to 25.0'					
						Boring log continued of page 3 from a depth of 25.0'.	

Site: Watertown Arsenal	Boring No. FD-83-1	Page 4 of 5

DEPTH	Ft.	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	26	S6	1 3/8"	25' to 27'	8 15 22 25	Drove 1 3/8" ID by 24" split-barrel sampler from 25' to 27'. Recovered 18"	Wet, medium Fine brown sand, Some silt with Clay layers.
27.5		No Sample taken From 27.0-28.0'				Drove 2 1/2 casing to 28'	
	28	S7	1 3/8	28' to 30'	15 12 20 31	Drove 1 3/8" ID by 24" split-barrel sampler from 28' to 30'. Recovered 19"	Wet, Hard, Brown Clay, Some silt. Trace of fine Sand.
	30 32	No samples from 28 to 30'				Drove Casing to 30'. Completed remainder of boring w/o casing Hole remained open	
					14 20	Drove 1 3/8" ID by 24" split-barrel sampler from	
34		S8	1 3/8	34' to 35'	28 30	33 to 35. Recovered 20"	Wet, Compact, Fine to Medium Gray Silty Sand.
	36	No samples taken from 35 to 38'					
	38	S9	1 3/8"	38 to 39	8 10	Drove 1 3/8" ID by 24" split-barrel sampler	
39		S9A	1 3/8"	39' to 40'	18 23	from 38 to 40' Recovered 16"	Wet, compact, brown sand, clay and silt
	40					Bottom of Boring at 40'	

Site: Watertown Arsenal
Boring No: FD-83-1

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
6-15-83		30'	40'	11.5'		
6-15-83		15'	40'	11.5'		
6-15-83		10'	40'	Not encountered		
	2:00 PM					

Note: Depths are in feet below original ground

BORING LOCATION SKETCH

GEB Requisition #83-39

Inspection and Exploration Instructions
Attachment No. 1

PROJECT: Exploration for Determining Subsurface Conditions for Proposed Hydraulic Piston Elevator

SITE: Building 313 No., Watertown Arsenal, Watertown, MA.

PURPOSE: The subsurface investigation is to determine the foundation conditions for a proposed hydraulic piston elevator being designed by an A-E for Watertown Arsenal.

SCOPE OF INVESTIGATION

1. Coordinate all activities with Captain Binseel (923-5717) of Watertown Arsenal. He will have a facility engineer crew ready to assist driller on 13 June 1983.

2. Locate exploration as near to the center of the existing elevator shaft as possible.

3. Perform one wash boring with standard penetration test (SPT) every 5 feet or at change in materials. The boring shall be driven 40 feet unless refusal is encountered. Refusal is defined as 100 blows with a 300 pound hammer or bouncing refusal.

4. All samples obtained shall be provided to Captain Binseel prior to leaving the site.

5. Inspection and logging the exploration hole shall be the responsibility of the driller.

SITE CONDITIONS

The site conditions were as viewed by Mr. Nicholas Lanney on 7 June 1983. An existing elevator cage exists in the elevator shaft where the exploration is to be performed. Portions of this cage will be removed by facility engineer personnel prior to start of drilling.

EXPLORATION NUMBER

The exploration shall be numbered FD-83-1.

COMPLETION SCHEDULE

All work under this Delivery Order shall be completed within 20 calendar days following receipt of Notice to Proceed.

EGA
EASTERN GEOTECHNICAL ASSOCIATES • BRIGGS
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